

What is claimed is:

1. A method for verifying a predetermined bearing preload of differential bearings in a differential assembly module during the mounting thereof to an axle support beam member of a drive axle assembly, said axle support beam member having a substantially flat central plate section and at least two mounting studs outwardly extending therefrom, said differential assembly module including a differential carrier frame member having two bearing hub portions axially spaced in transverse direction each provided for receiving one of said differential bearings for rotatably supporting a differential case, each of said bearing hub portions of said differential carrier frame member having at least one mounting bore for receiving one of said at least two mounting studs of said support beam member, an axial spacing in transverse direction between said at least two mounting studs is complementary to a spacing in transverse direction between said mounting bores in said bearing hub portions when said differential bearings are properly preloaded to said predetermined bearing preload in accordance with a manufacturer's specification, said method comprising the steps of:
  - a) providing said differential carrier frame member;
  - b) mounting one of said differential bearings to each of said bearing hub portions of said differential carrier frame member and a differential case rotatably supported by said differential bearings;
  - c) preloading each of said differential bearings to said predetermined bearing preload in accordance with the manufacturer's specification;
  - d) providing said support beam member;
  - e) inserting said mounting bores in said bearing hub portions of said differential carrier

frame member about said mounting studs; and

f) determining that said differential bearings are properly preloaded if said mounting studs are received in said mounting bores in said differential carrier frame member without substantial resistance; or

5 g) determining that said differential bearings are not properly preloaded if said mounting studs may not be received in said mounting bores in said differential carrier frame member or if said mounting studs are received in said mounting bores in said differential carrier frame member with substantial resistance.

10 2. The method for verifying said predetermined bearing preload of said differential bearings as defined in claim 1, wherein said at least two mounting studs extend substantially orthogonally to a rear mounting surface of said central plate section of said support beam member.

15 3. The method for verifying said predetermined bearing preload of said differential bearings as defined in claim 1, further including the step of fastening said differential carrier frame member to said central plate section by threaded nuts complementary to said at least two mounting studs subsequent to the step of determining that said differential bearings are properly preloaded.

20 4. The method for verifying said predetermined bearing preload of said differential bearings as defined in claim 1, wherein said central plate section of said support beam member has an opening therethrough and substantially flat front and rear mounting surfaces,

and wherein said at least two mounting studs outwardly extend from said rear mounting surface of said central plate section of said support beam member.

5           5. The method for verifying said predetermined bearing preload of said differential bearings as defined in claim 1, wherein said axle support beam member has two pairs of said mounting studs outwardly extending from said central plate section of said axle support beam member, and wherein each of said bearing hub portions of said differential carrier frame member has one pair of said mounting bores.

10           6. The method for verifying said predetermined bearing preload of said differential bearings as defined in claim 3, wherein said central plate section of said support beam member has an opening therethrough, wherein said differential carrier frame member further includes a neck portion for rotatably supporting a drive pinion and two opposite leg portions each provided with one of said bearing hub portions, and wherein said differential carrier  
15           frame member of said differential assembly module is fastened to said rear mounting surface of said central plate section of said support beam member so that said neck portion of said differential carrier frame member extends through said opening in said support beam member.

20           7. The method for verifying said predetermined bearing preload of said differential bearings as defined in claim 1, wherein each of said bearing hub portions of said differential carrier frame member is provided with a mounting flange portion provided with said at least one mounting bore.

8. The method for verifying said predetermined bearing preload of said differential bearings as defined in claim 1, further including the step of adjusting said differential bearing preload in accordance with the manufacturer's specification subsequent to the step of determining that said differential bearings are not properly preloaded.

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9. A method for verifying a predetermined bearing preload of differential bearings in a differential assembly module during the mounting thereof to an axle support beam member of a drive axle assembly; said axle support beam member including a substantially flat central plate section having an opening therethrough, substantially flat front and rear mounting surfaces and two pairs of mounting studs extending substantially orthogonally outwardly from said rear mounting surface of said central plate section of said support beam member; said differential assembly module including a differential carrier frame member having a neck portion and two bearing hub portions for receiving said differential bearings for rotatably supporting a differential case and having mounting flange portions axially spaced in transverse direction; each of said mounting flange portions having a pair of mounting bores for receiving one of said two pairs of mounting studs of said support beam member; an axial spacing in transverse direction between said two pairs of mounting studs is complementary to a spacing in transverse direction between said pairs of mounting bores in said bearing hub portions when said differential bearings are properly preloaded to said predetermined bearing preload in accordance with a manufacturer's specification, said method comprising the steps of:

a) providing said differential carrier frame member;

b) mounting one of said differential bearings to each of said bearing hub portions of

said differential carrier frame member and said differential case rotatably supported by said differential bearings;

c) preloading each of said differential bearings to said predetermined bearing preload in accordance with the manufacturer's specification;

5 d) providing said support beam member;

e) inserting said mounting bores in said bearing hub portions of said differential carrier frame member about said mounting studs; and

f) fastening said differential carrier frame member to said central plate section by threaded nuts complementary to said mounting studs if said mounting studs are received in  
10 said mounting bores in said differential carrier frame member without substantial resistance;  
or

g) adjusting said differential bearing preload in accordance with the manufacturer's specification if said mounting studs may not be received in said mounting bores in said differential carrier frame member or if said mounting studs are received in said mounting  
15 bores in said differential carrier frame member with substantial resistance; and

h) fastening said differential carrier frame member to said central plate section by said threaded nuts if said mounting studs are received in said mounting bores in said differential carrier frame member without substantial resistance subsequent to the step of adjusting said differential bearing preload.

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10. A method for assembling a drive axle assembly of a motor vehicle, said drive axle assembly comprising a support beam member and a differential assembly module, said method comprising the steps of:

a) providing said support beam member having a substantially flat central plate section and at least two mounting studs outwardly extending therefrom;

b) providing said differential assembly module including a differential carrier frame member having two bearing hub portions axially spaced in transverse direction each provided  
5 for receiving one of differential bearings for rotatably supporting a differential case, each of said bearing hub portions of said differential carrier frame member having at least one mounting bore for receiving one of said at least two mounting studs of said support beam member, wherein an axial spacing in transverse direction between said at least two mounting studs is complementary to a spacing in transverse direction between said mounting bores in  
10 said bearing hub portions when said differential bearings are properly preloaded to a predetermined bearing preload in accordance with a manufacturer's specification;

c) mounting one of said differential bearings to each of said bearing hub portions of said differential carrier frame member and said differential case rotatably supported by said differential bearings;

15 d) preloading each of said differential bearings to said predetermined bearing preload in accordance with the manufacturer's specification;

e) inserting said mounting bores in said bearing hub portions of said differential carrier frame member about said mounting studs;

f) determining that said differential bearings are properly preloaded if said mounting  
20 studs are received in said mounting bores in said differential carrier frame member without substantial resistance; or

g) determining that said differential bearings are not properly preloaded if said mounting studs may not be received in said mounting bores in said differential carrier frame

member or if said mounting studs are received in said mounting bores in said differential carrier frame member with substantial resistance; and

h) fastening said differential carrier frame member to said central plate section by threaded nuts complementary to said at least two mounting studs subsequent to the step of  
5 determining that said differential bearings are properly preloaded.

11. The method for assembling said drive axle assembly as defined in claim 10,  
wherein said central plate section has substantially flat front and rear mounting surfaces, and  
wherein said at least two mounting studs extend from said rear mounting surface.  
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12. The method for assembling said drive axle assembly as defined in claim 11,  
further including the step of securing a front cover to said front mounting surface of said  
central plate section of said support beam member.

13. The method for assembling said drive axle assembly as defined in claim 11,  
further including the step of securing a rear cover to said rear mounting surface of said central  
plate section of said support beam member.  
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14. The method for assembling said drive axle assembly as defined in claim 11,  
20 wherein said central plate section of said support beam member has an opening therethrough,  
wherein said differential carrier frame member further includes a neck portion for rotatably  
supporting a drive pinion and two opposite leg portions each provided with one of said  
bearing hub portions for rotatably supporting said differential case, and wherein said

differential carrier frame member of said differential assembly module is fastened to said rear mounting surface of said central plate section of said support beam member so that said neck portion of said differential carrier frame member extends through said opening in said support beam member.

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15. The method for assembling said drive axle assembly as defined in claim 10, wherein each of said bearing hub portions of said differential carrier frame member is provided with a mounting flange portion provided with said at least one mounting bore.

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16. The method for assembling said drive axle assembly as defined in claim 10, further including the step of adjusting said differential bearing preload if in accordance with the manufacturer's specification subsequent to the step of determining that said differential bearings are not properly preloaded.

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17. The method for assembling said drive axle assembly as defined in claim 10, wherein said support beam member of said drive axle assembly further includes two opposite arm sections extending from said central plate section.

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18. The method for assembling said drive axle assembly as defined in claim 17, wherein said central plate section of said support beam member is enlarged relative to said arm sections.

19. The method for assembling said drive axle assembly as defined in claim 10,  
wherein said flat central plate section of said support beam member defines a support plane  
that is substantially orthogonal to a driving direction of said motor vehicle.

5           20. The method for assembling said drive axle assembly as defined in claim 10,  
wherein said axle support beam member has two pairs of said mounting studs outwardly  
extending from said central plate section of said axle support beam member, and wherein each  
of said bearing hub portions of said differential carrier frame member having one pair of said  
mounting bores.

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